TECHNICAL/REQUIREMENTS

DIVISION V - STRUCTURES

V.1 SLOPE PROTECTION

V.1.A.00 DESCRIPTION/SCOPE

This section covers work necessary for slope paving, placing riprap as slope protection, and/or other methods of slope protection as hereinafter specified.

V.1.B.00 DEFINITIONS

V.1.B.01 SLOPE PAVING

Slope paving shall consist of precast cement concrete blocks, poured portland cement concrete, pneumatically placed portland cement concrete, or asphaltic concrete paving, constructed on prepared slopes.

V.1.B.02 RIPRAP

Riprap shall consist of broken stone, wire enclosed stone, grouted stone, or sacked concrete, constructed on prepared slopes, filter blankets, or other places, as specified.

V.1.B.03 WIRE ENCLOSED STONE

Wire enclosed stone shall consist of rectangular compartments of wire mesh material filled with stones.

V.1.B.04 FILTER BLANKET

Filter blankets shall consist of one or more layers of graded material placed on a prepared slope prior to placing the riprap thereon to prevent underlying material from passing through the riprap.

V.1.C.00 MATERIALS

V.1.C.01 PAVING BLOCKS

Precast cement concrete blocks shall conform to ASTM C90 for hollow block and C145 for solid block, Grade N II. Blocks may be manufactured with integral spacer devices that will provide required 1/2" mortar joint.

V.1.C.02 PORTLAND CEMENT CONCRETE

Portland cement concrete materials shall conform to the requirements of Section III.5.C.00, MATERIALS.

V.1.C.03 ASPHALTIC CONCRETE

Asphaltic concrete materials shall conform to the requirements of Section III.4.C.00, MATERIALS.

V.1.C.04 RIPRAP PROTECTION

Riprap will conform with provisions of ODOT's Standard Specifications, Section 00390, Riprap Protection.

V.1.C.05 WIRE ENCLOSED STONE

V.1.C.05.1 STONE

Wire enclosed stone shall be hard, durable, crushed, quarried, or natural stone having an apparent specific gravity of not less than 2.4. The absorption shall not exceed 4%, unless otherwise specified. The stone shall be free of weak laminations and cleavages and shall be of a quality that will not disintegrate on exposure to water or weathering. For wire enclosed stone aggregate, round or angular stones shall be used and not less than 95% of the stone shall be retained on a screen or wire having 2" square openings.

V.1.C.05.2 WIRE

Chain link fence fabric shall conform to the requirements of AASHTO M 181. The fabric shall be 11-gauge, 2" mesh with Class I coating meeting the requirements of ASTM A392.

Welded wire fabric shall conform to the requirements of AASHTO M55. The fabric shall be 11-gauge, 2" mesh with Class I coating meeting the requirements of ASTM A116.

Lacing and tie-wire shall be galvanized, 12-1/2-gauge smooth steel wire. In lieu of lacing, 9-gauge galvanized hog rings at 4" spacings may be used for fastening ends, sides, and top panels.

V.1.C.06 GROUT

Grout shall consist of one part portland cement and three parts clean, well-graded sand which will pass a 1/8" screen, thoroughly mixed with water to produce a thick, creamy consistency.

V.1.C.07 WIRE MESH

Wire mesh shall be welded wire fabric conforming to the requirements of ASTM A185, unless otherwise specified.

V.1.C.08 DELETED

V.1.C.09 FILTER BLANKET

Filter blanket material shall be composed of tough, durable particles of gravel or rock of a thickness and gradation designated. The particles shall be reasonably free from thin, flat, and elongated pieces, and containing no organic matter nor soft, friable particles in excess of those approved by the Engineer.

V.1.D.00 CONSTRUCTION

V.1.D.01 PREPARATION

Slope and other areas requiring protection shall be cleared of all organic material and shaped to a smooth surface. The areas shall be shaped to allow full thickness of the proposed protection. The slopes shall not be steeper than the natural angle of repose of the slope unless specified or directed. The remaining undisturbed material shall be compacted to a minimum of 90% of the maximum relative density as determined by AASHTO T99.

Where soft or spongy material exists, it shall be removed to a depth as specified or as directed by the Engineer and replaced with material as approved by the Engineer and compacted to a density as directed.

V.1.D.02 PAVING BLOCKS

Paving blocks shall be placed in such a manner that they rest firmly and evenly against the slope. The blocks shall be placed in horizontal parallel courses and successive courses shall break joints with the preceding course to form a running bond. Joints beween blocks shall be neatly grouted.

V.1.D.03 POURED PORTLAND CEMENT CONCRETE

Portland cement concrete shall be placed in such a manner so as to form a dense, impervious, and uniform surface. Unless otherwise specified, the thickness shall be a minimum of 4" and the concrete shall develop a 28-day minimum compressive strength of 3000 psi.

When reinforcement is required, wire mesh shall be utilized. The wire mesh shall lap a minimum of one mesh spacing with the laps fastened securely at the ends. The wire mesh reinforcement shall be placed to provide a minimum of 1 1/4" of concrete cover. Curing and testing operations shall conform to the applicable sections of Section II.5, PORTLAND CEMENT CONCRETE PAVEMENT.

V.1.D.04 PNEUMATICALLY PLACED PORTLAND CEMENT CONCRETE

Before placement of any portion of pneumatically placed concrete, the Contractor shall obtain the Engineer's approval as to the type of equipment and method of operation to be used.

Where reinforcement is required, it shall conform with the requirements of Section V.1.D.03, POURED PORTLAND CEMENT CONCRETE.

V.1.D.05 ASPHALTIC CONCRETE SLOPE PAVING

A prime coat shall be applied to the prepared slope surface prior to paving with the hot asphaltic concrete mix, the class as specified. The asphaltic concrete shall be placed and compacted on the slope in such a manner so as to form a compact, dense, and impervious pavement with a uniform plane surface. The thickness of the slope paving shall be as specified. After each lift of asphaltic concrete has been spread, struck off, and surface defects and other irregularities remedied, the mix shall be thoroughly and uniformly compacted in conformance with Section II.4.D.10, COMPACTION AND DENSITY.

V.1.D.06 RIPRAP PROTECTION

Riprap construction will conform with provisions of ODOT's Standard Specifications, Section 00390, Riprap Protection.

V.1.D.07 DELETED

V.1.D.08 DELETED

V.1.D.09 WIRE ENCLOSED STONE

Wire enclosure segments shall be hand or machine formed to the dimensions as specified. The enclosures shall be placed, laced, and filled to provide a uniform, dense, protective coating, shaped and located as approved by the Engineer.

Each wire enclosure shall be tied to adjoining wire enclosures along all contacting edges at intervals of 6". Where manufacturer's enclosures are specified or used, installation shall conform to the manufacturer's specifications unless otherwise specified.

V.1.D.10 FILTER BLANKET

When specified, a filter blanket shall be placed on a prepared area to the full thickness of each layer in one operation, using methods which will not cause segregation of particle sizes within the layer. The surface of the finished layer shall be reasonably even and free from mounds or irregularities.

V.1.E.00 TESTING

V.1.F.00 MEASUREMENT AND PAYMENT

V.1.F.01 MEASUREMENT

V.1.F.01.1 MEASUREMENT BY SQUARE YARD

As listed herein in Section V.1.F.02, PAYMENT, and as specified, quantities for slope protection will be measured on a square yard basis in place. The measurement will be based upon the top surface length and width, up to the specified length and width, of the slope protection measured to the nearest 0.1' and the area measured to the nearest square yard.

V.1.F.01.2 MEASUREMENT BY CUBIC YARD

As listed herein in Section V.1.F.02, PAYMENT, and as specified, quantities for slope protection will be measured on a cubic yard basis. The measurement will be based on a cross-section of properly placed protection in place on the designated areas and to the lines and grades as specified.

V.1.F.01.3 MEASUREMENT BY TON

As listed herein in Section V.1.F.02, PAYMENT, and as specified, quantities for slope protection will be measured on a ton basis, to the nearest 0.1-ton, up to the specified amount of slope protection. Material receipts showing certified scale weights will be required from the Contractor.

V.1.F.02 PAYMENT

V.1.F.02.1 GENERAL

Payment for the following listed items which may appear in the bid Proposal and for other bid items which may become applicable to slope protection performed on the contract work under Section V.1, SLOPE PROTECTION, by reason of Special Provisions, shall be understood to comprise full and complete compensation for all labor, equipment, tools, materials, and incidentals necessasry for all of the contract work as specified under or covered by this Section.

When neither specified or listed in the Proposal for separate payment, any and all work specified for performance under or covered by this Section will be considered as incidental work for which no separate payment will be made.

V.1.F.02.2 PAYMENT ON LUMP SUM BASIS

When shown in the proposal, payment will be made on a lump sum basis and this

payment will include full compensation for all work and materials necessary for slope protection within the limits shown and as specified.

V.1.F.02.3 PAY ITEMS

Pay Item Description	Unit of Measure
Paving Block Slope Protection	Square Yards
Poured Portland Cement Concrete Slope Protection	Square Yards
Pneumatically Placed Portland Cement Concrete Slope Protection	Square Yards
Asphaltic Concrete Slope Protection	Square Yards or Tons
Riprap Protection	Square Yards, Cubic Yards or Tons
Wire Enclosed Stone	Square Yards or Cubic Yards
Filter Blanket	Square Yards, Cubic Yards or Tons